Arbovirus Surveillance Summary, 2010
Massachusetts Department of Public Health (MDPH)
Arbovirus Surveillance Program

WEST NILE VIRUS (WNV)

Birds

The MDPH Arbovirus Surveillance Program discontinued routine dead bird reporting in 2009. Information related to bird die offs should be reported to the Massachusetts Division of Fisheries and Wildlife (MDFW) and poultry flocks experiencing sudden mortality or illness should be reported to the Massachusetts Department of Agricultural Resources (MDAR).

Mosquito Samples

One-hundred and twenty-one of the 3558 mosquito samples collected in Massachusetts were positive for WNV in 2010. Positive samples were identified in 42 towns in 7 counties. Positive mosquito samples included 90 *Culex pipiens/restuans* complex, 13 *Culex pipiens*, 11 *Culex species*, six *Culiseta melanura*, and one *Coquillettidia perturbans.* Mosquitoes in the *Culex* genus feed mainly on birds and occasionally on mammals, including humans. *Culex pipiens* and *Culex restuans* are primarily responsible for WNV transmission in birds in Massachusetts. *Culiseta melanura* feeds almost exclusively on birds and is the primary enzootic vector of eastern equine encephalitis (EEE) virus although it can also carry WNV. *Coquillettidia perturbans* is an aggressive mammal biting mosquito and can be involved in the transmission of both WNV and eastern equine encephalitis (EEE) virus to humans in Massachusetts. For a complete list of positive mosquito samples by city/town, please see the annual Cumulative Mosquito Summary by County and Municipality report.

Animals

One horse tested positive for WNV in 2010. This horse was stabled in Hudson, Middlesex County, and had an illness onset of 9/15/2010.

Humans

There were seven human cases of WNV infection identified in Massachusetts in 2010, as summarized below.

County	Age Range	Onset Date	Virus Result	Clinical Presentation
Hampden	over 64	10/4/2010	WNV	meningoencephalitis
Middlesex	45-64	8/29/2010	WNV	meningitis
Suffolk	over 64	10/1/2010	WNV	encephalitis
Suffolk	over 64	9/13/2010	WNV	meningoencephalitis
Suffolk	45-64	8/18/2010	WNV	meningoencephalitis
Worcester	25-44	8/25/2010	WNV	fever
Worcester	over 64	8/19/2010	WNV	meningoencephalitis

The number of confirmed human cases nationwide was higher in 2010 (981) compared to 2009 (720).

Specimens Tested and WNV Positive by Year, 2006-2010

Species	2006		2007		2008		2009		2010	
	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive	Tested	Positive
Birds	313	57	223	43	139	63	n/a	n/a	n/a	n/a
Mosquito Pools	9344	43	7271	65	4575	136	3410	26	3558	121
Animal	16	0	8	0	14	0	13	1	17	1
Humans	649	3	392	6*	385	1	267	0	383	7

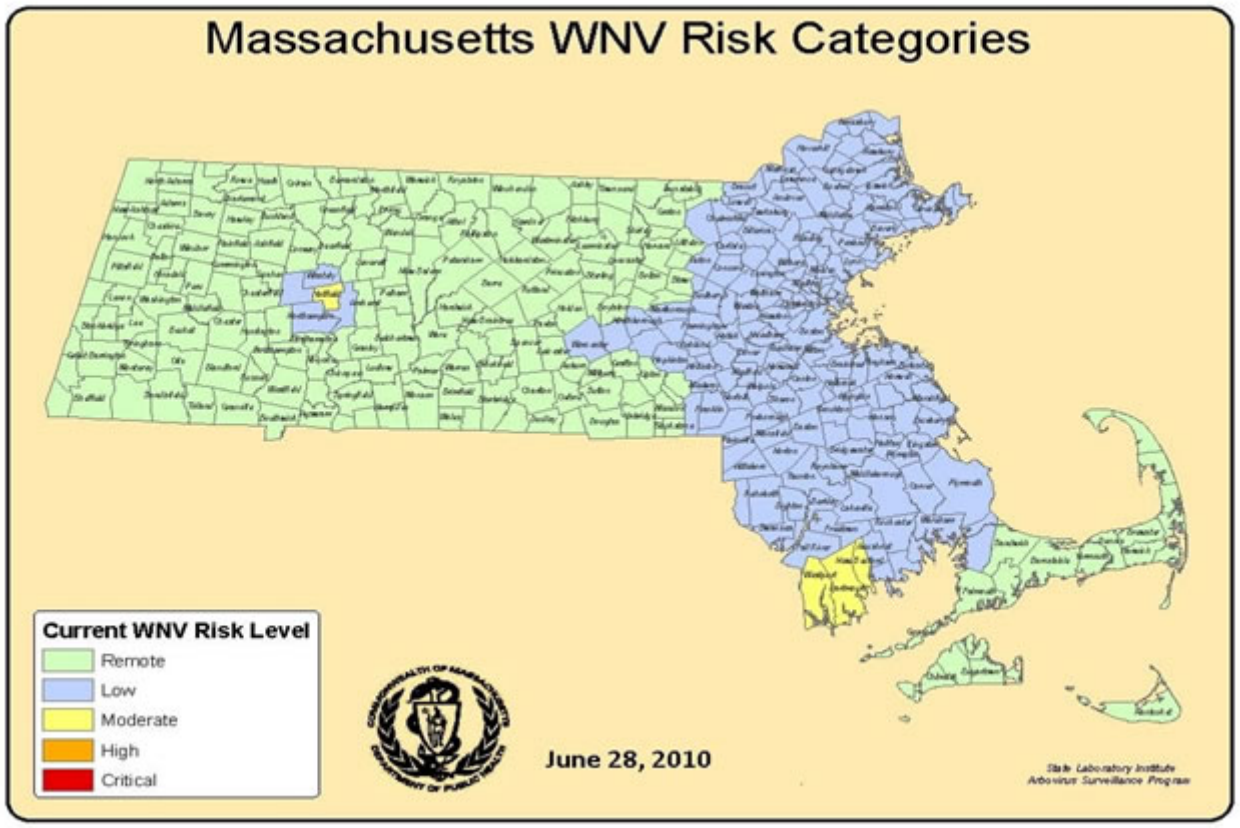
* One MA case exposed out-of-state and two out-of-state cases exposed in their home states are not included.

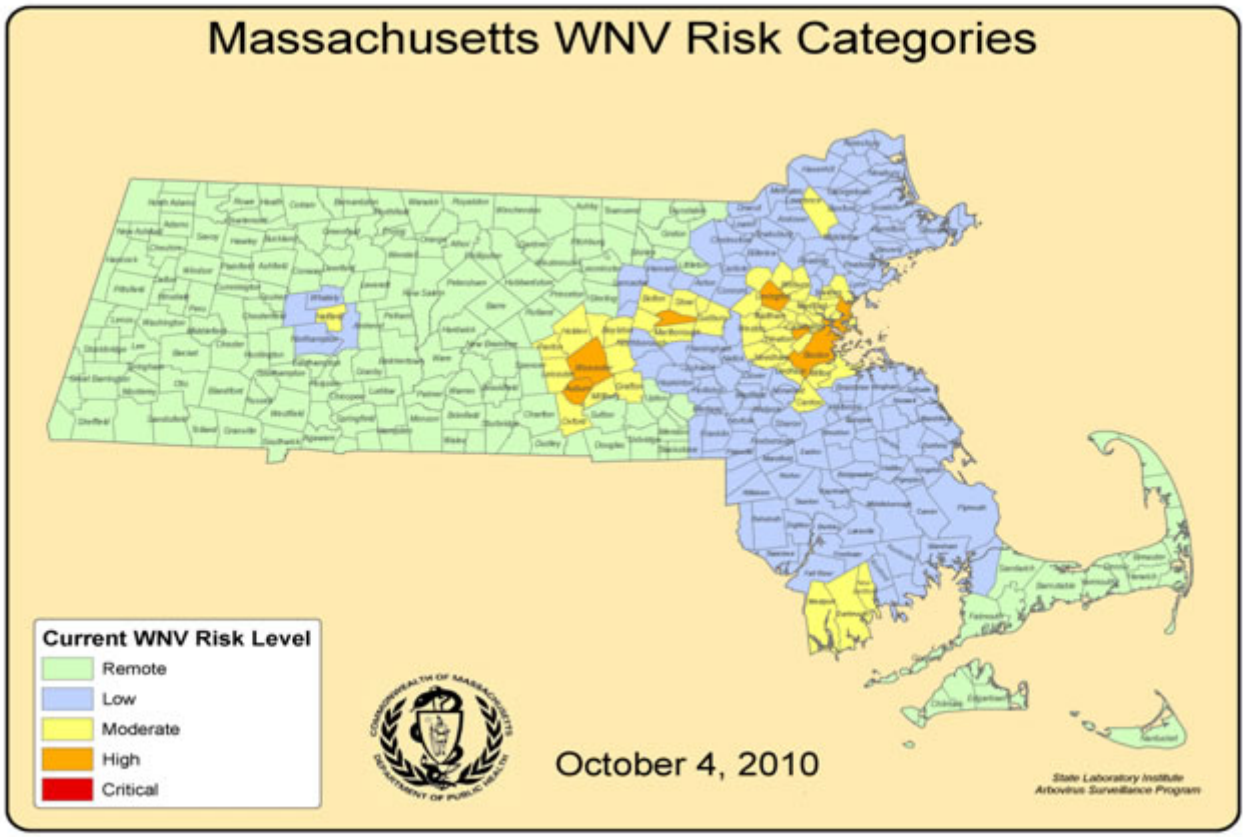
Geographic Risk Levels

Arbovirus risk maps are produced by integrating historical data and areas of mosquito habitat with current positive virus isolations (in humans, mosquitoes, etc) and weather conditions. Risk levels served as a relative measure of the likelihood of an outbreak of human disease and were updated weekly based on that week's surveillance data. Initial and final WNV risk levels from the 2010 season are provided in the following maps. This information will be used to help predict risk in 2011, and will be revised as 2011 surveillance data is collected.

Initial and Final 2010 WNV Risk Categories
(June 28 and October 4, 2010)

(As described in Table 1 of the 2010 MDPH Arbovirus Surveillance and Response Plan which can be found at www.mass.gov/dph under "Information for Local Boards of Health")





EASTERN EQUINE ENCEPHALITIS (EEE) VIRUS

Birds

Birds are not routinely tested for EEE virus in Massachusetts because the results do not provide useful information on the level of human risk.

Mosquito Samples

Sixty-five of 3558 mosquito samples collected in Massachusetts were positive for EEE virus in 2010. They were collected from 19 towns in three counties. Positive EEE virus mosquito samples included 42 *Culiseta melanura*, 21 *Coquillettidia perturbans*, one *Ochlerotatus canadensis*, and one *Culex pipiens/restuans*. Both *Coquillettidia perturbans* and *Ochlerotatus canadensis* species are aggressive mammal biting mosquitoes and can be involved in the transmission of both WNV and EEE virus to humans in Massachusetts. For a complete list of positive mosquito samples by city/town, please see the annual Cumulative Mosquito Summary by County and Municipality report.

Animals

Four horses were identified as positive for EEE virus in 2010 as summarized below.

City or Town	Animal Species	Onset Date	Virus Result
Lancaster	Horse	8/12/2010	EEEv
Middleborough	Horse	7/20/2010	EEEv
Plympton	Horse	8/2/2010	EEEv
Warren	Horse	7/31/2010	EEEv

Humans

A human case of EEE infection was identified in a Plymouth County resident aged 25-44 years, with an onset date of 8/21/2010 and a clinical presentation of encephalitis. A case was also identified in a Rhode Island resident aged less than 25 years with an onset date of 8/5/2010 and a clinical presentation of encephalitis. An epidemiologic investigation determined that this individual was most likely exposed in Southeastern Massachusetts.

Geographic Risk Levels

Arbovirus risk maps are produced by integrating historical data and areas of mosquito habitat with current positive virus isolations (in humans, mosquitoes, etc) and weather conditions. Risk levels serve as a relative measure of the likelihood of an outbreak of human disease and were updated weekly based on that week's surveillance data. Initial and final EEE risk levels from the 2010 season are provided in the following maps. This information will be used to help predict risk in 2011, and will be revised as 2011 surveillance data is collected.

Final 2010 EEE Risk Categories
(June 28 and August 30, 2010)

(As described in Table 2 of the 2010 MDPH Arbovirus Surveillance and Response Plan which can be found at www.mass.gov/dph under "Information for Local Boards of Health")